

The logo for GadgEon, with 'Gadg' in blue and 'Eon' in orange.

Engineering Smartness

# SCADA SYSTEM FOR OIL FIELDS

April, 2020

Version 01



# SCADA system for Oil Fields



Customer developed a proprietary sensor and wanted to automate the tasks historically performed manually by a “Pumper” job role.

## Solution Description

- Overall system architecture for the wireless sensor network
- Firmware for sensor nodes with MSP430 and Xbee Digimesh modules, Interfacing with various sensors via ADC, GPIO, 1 wire and i2c
- Definition of communication protocol over Digi mesh for sensor data and alarms with very small payloads
- Implementation of image transfer over Digimesh with limited payload, software on concentrator node running Linux
- Web interface for system bring up and configuration
- Data backup to DB in case of connectivity loss
- Uploading data to server using http/MQTT
- Performance optimization of Digimesh for image transfer
- Hardware design for the sensor nodes, Board bring up, integration

## Outcome and Benefits Delivered

- GadgEon designed the HW, radio communication system and built the back-end cloud systems
- Data collection system and automated control system was implemented
- System deployed and operating in Texas Oil Fields presently.



# The Business Context and Challenges of the Customer

## Challenge

- Individual pump health difficult to detect, resulting in high-cost of ownership per pump

## Feasibility Study and Documentation

- Requirements Gathering & Analysis, competitive product study,
- H/W Architecture development and finalization
- Component selection of all components and BOM management.

# The Solution / System Description

## **POD Hardware and Firmware**

- MSP430, Xbee digimesh, Sensor integration 4-20mA circuits, Analog inputs, Temperature sensor, PIR motion sensor, Digital inputs, Relays and Camera module
- Proprietary protocol over Digi mesh to exchange sensor data, optimized for small payloads

## **Hub Firmware**

- MQTT for cloud communication, Firmware upgrade support, reassembly of packets to create image from segmented packets over Digimesh.
- Web UI for system configuration and status. Data backup to DB in case of uplink connectivity loss.

## **Cloud server**

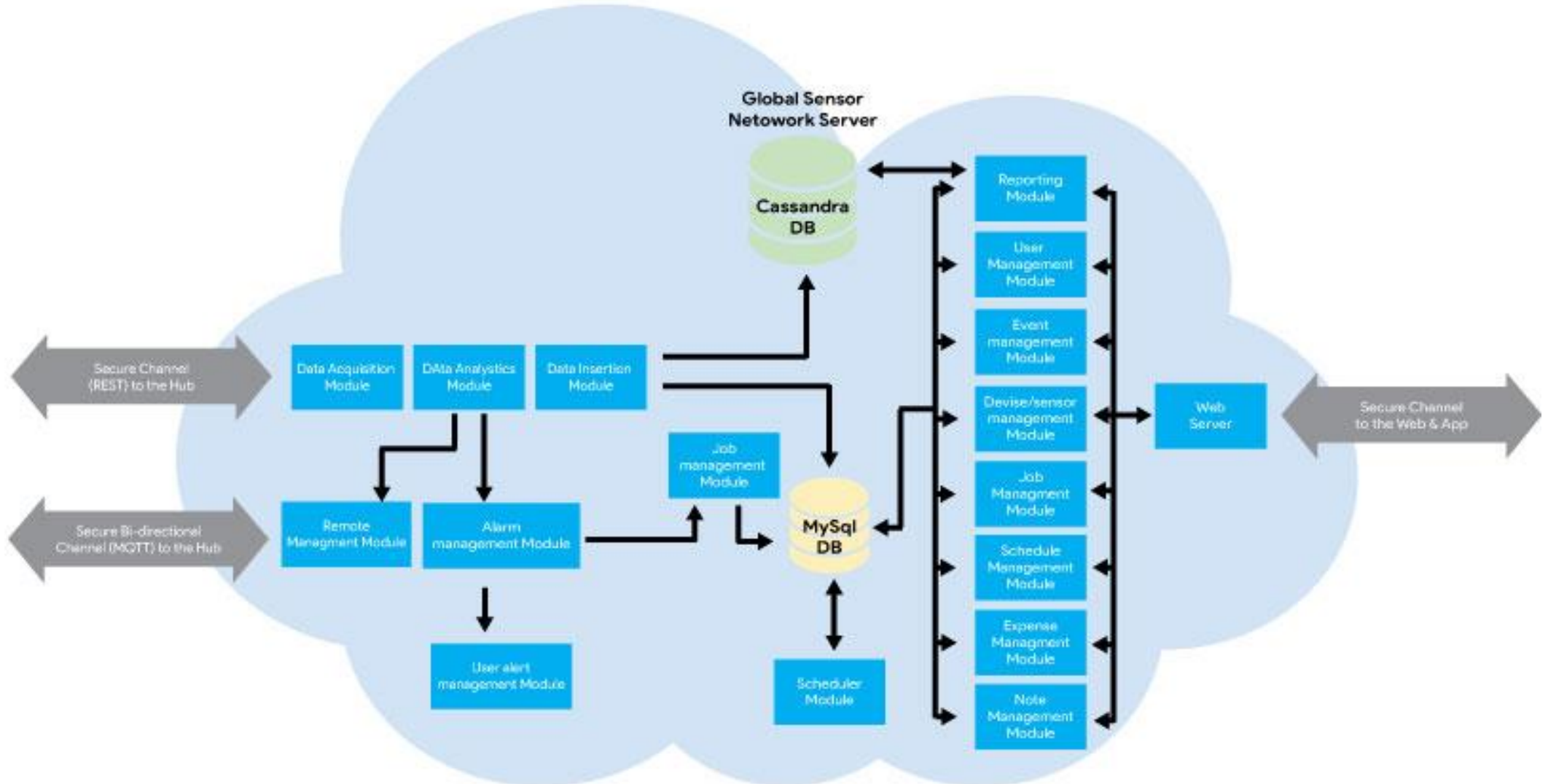
- User & Device Management, data storage, alert notifications, interpretation, intelligence, reporting and distribution to the mobile devices interacting with the Cloud server. The Cloud platform used is Amazon AWS

## **iOS Mobile App Design and Development**

- Controlling and managing the hub
- The iOS App will enable plumbers to monitor the field equipment, receive notifications and remotely manage them.

# System / Architecture Description

## SmartField – Cloud Architecture

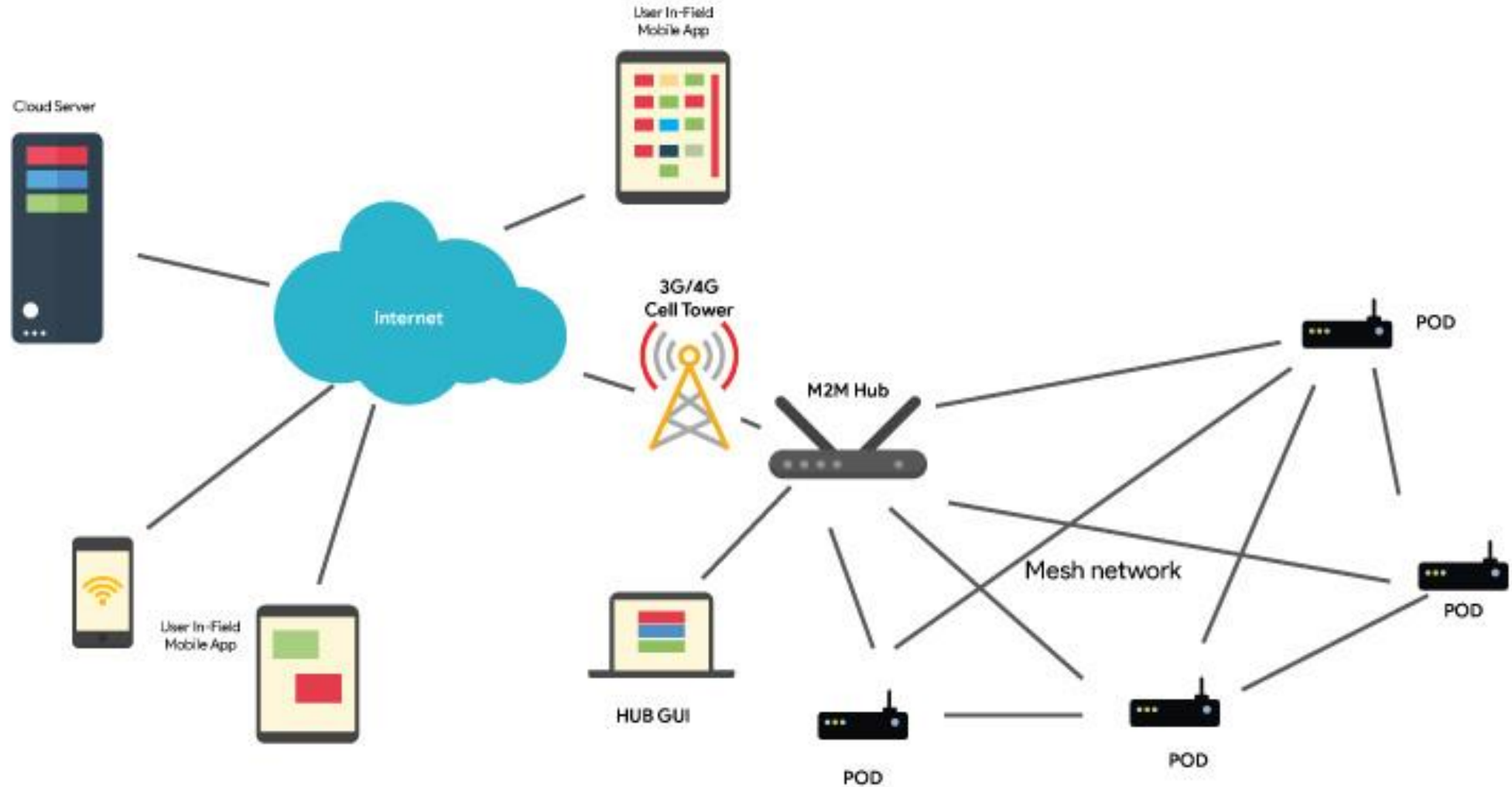






# The System Description

SmartField – Data Flow diagram



**THANK YOU**



**For More Details, Let's Connect**



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